Kreutzer, R., R. Schlag, E. Glazer, G. Micarelli, E. Blake and L.R. Goldman (1990). Investigation of the Montecito leukemia and lymphoma cluster, final report. Emeryville, California Department of Health Services, Environmental Epidemiology and Toxicology Section.

SUMMARY

In April 1989, Montecito citizens concerned about what they believed to be an unusually high number of cancer cases among neighborhood children contacted the Santa Barbara County Department of Health Services (DHS) to collaborate with investigating the citizens' report. The investigation confirmed the citizens' suspicions: six cases of leukemia and lymphoma were found to have been diagnosed between 1981 and 1988 among Montecito children 19 years old or younger. This number is almost 5 times greater than the number of cases one would normally see during an eight-year period in a population the size of Montecito's.

DHS extensively interviewed parents of five of the children (one family declined to participate), but found nothing in common among them or the children that might have been a cause of the cancers. (For example, the parents did not have unusual or shared exposures at work to cancer-causing chemicals; the mothers had not taken any medications during pregnancy that might have been harmful to the children before they were born.)

An environmental assessment was also conducted. The county health department researched and collected historical information that might show contamination of the community. Aerial photos dating from 1928 to 1985 were examined for agricultural and industrial land use. Several other sources were researched, and a local historian was consulted. The county and DHS found no evidence of past events that might have caused significant community wide contamination.

DHS took samples of tap water and soil from the homes and yards of the children and from the Montecito Union Elementary School, which four of the children had attended. For comparison, water and soil samples were also taken from a home where no children had cancer. The department's Hazardous Materials Laboratory and Sanitation and Radiation Laboratory analyzed the samples looking for hazardous chemicals. EETS reviewed the analyses, and did not find any level of contamination, or a pattern of contamination, that might contribute to the cancer cases.

Members of the community expressed concern about possible health effects from electromagnetic fields (EMF) emanating from the transformer station on the north edge of the elementary school, and the power transmission lines that cross over the school. EETS took EMF measurements at the school, using two different types of instruments as a double check on accuracy. The highest EMF measurement was near the corner of Santa Rosa Road and School House Road, across the street from the transformer station and directly under the power line. This location is across the street from the north side of the school playing field. The amount of EMF measured at this site was 14 millegauss (abbreviated mG), and is similar to magnetic field exposures when a person uses appliances (such as a can opener, electric mixer, home computer, television or an office copying machine). The lowest measurements were found in the kindergarten playground, where the maximum reading was 1 mG. This measurement is similar to those people are exposed to in a home when they are not near an operating appliance. Levels

of the magnetic fields drop lower than this while on school grounds as one moves further form the transformer, but these were not systematically measured.

In conclusion, DHS has verified the presence of a cluster of leukemia and lymphoma cases in Montecito from 1981-88. After investigating many components of the environment that might have any known association with cancer, DHS found nothing that would increase cancer risk in the area.

Cancer causation is a complex and poorly understood interaction between the individual's genetic make-up and his or her environment. Because the level of scientific knowledge about cancer causation is relatively low, the cause of specific cancer clusters has been determined in a very few cases. These have usually been among workers in the same plant or occupation, where exposures to toxic chemicals are relatively high.

A few other factors should be mentioned. Although white blood cell cancers are grouped together by the State for monitoring purposes, they actually include several types of cancers with different characteristics and, probably, different causes. In the Montecito cluster, there were four types of white blood cell cancers. This makes it even more difficult to determine a common cause. In addition, although the children with cancer lived close to one another, this fact in itself does not mean that the cases have a common cause. Neither does the fact that the cases occurred over only eight years: clustering can still be a random fluctuation in the cancer rate.

If either random fluctuation, or some environmental exposure no longer present cause the cluster, than we would expect the rate of these types of cancers to decrease back to or below the expected ("normal") rate. DHS therefore recommends that the California Tumor Registry conduct surveillance for the Montecito area, and report yearly on trends in cancer occurrence in the area.